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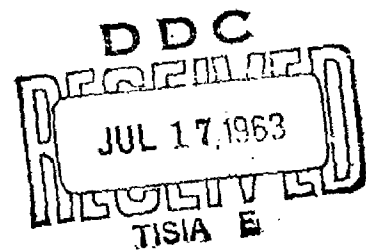
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SOVIET TRACTORS AND AGRICULTURAL MACHINERY
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USSR Industrial Development

SOVIET TRACTORS AND AGRICULTURAL MACHINERY

No. 68

This serial publication contains translations of selected articles on tractors and agricultural machinery in the Soviet Union, on the specific subjects indicated in the table of contents. Complete bibliographic information accompanies each article.

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TECHNICAL PROGRESS IN TRACTOR BUILDING

[Following is the translation of an article by B. G. Sivak, the director of Minsk Tractor Plant, in the Russian-language journal Traktory i Sel'khoz mashiny (Tractors and Farm Machinery), Moscow, No 4, April 1963, pp 1-3.]

Much work has been done by the workers of the Minsk Tractor Plant, inspired by the decisions of the 22nd Congress of the CPSU, for the continued steady increase of the rate of tractor production, perfecting the manufacturing methods and further technical progress of production.

By introducing new machinery and modern manufacturing methods, mechanization and automation of production processes, the plant's workers increase every year the output of more perfect universal row-crop Belarus' tractors.

Suffice it to say that in only four years of the Seven-Year Plan the plant has manufactured 16,000 tractors over and above the original plan, and altogether has given agriculture 60,000 more tractors than in 1955-1958. The average annual increase in the volume of production in the last four years amounted to over 40 percent.

In 1962, in spite of certain difficulties, the plant's workers have accomplished a continuous transition to the manufacture of a completely new tractor, the MTZ-50PL.

The annual plan was fulfilled by the plant's workers ahead of time, on 26 December. More than 6 million rubles' worth of commodity production was issued over and above the plan.

Labor productivity has been raised 1.4 percent as against the established plan, 11 million kw/hr of electric power and 29,000 megacals of heat were economized.

The rivalry between shops and divisions for the title of Communist Labor Collectives, the plant's competition with the collectives of the Minsk Motor Vehicle and the Volgograd Tractor plants have helped the successful fulfillment of the socialist pledges. The following compete at the plant for the title of the "Communist Labor Collective": 414 brigades, 152 sections, 36 shops and divisions, 113 operating crews. Some 4,687 persons for the honorary title of "Communist Labor Udarnik".

The honorary title of the Communist Labor Collective was given to the Machine Shop No 3 for the achieved successes. This lofty title has also been given to six production sections and 22 brigades, in which 1,542 persons are employed.

The honorary title of the Communist Labor Udarnik has been given to 647 foremost production workers. Among them are the steel workers I. Kiselev, who has produced in the course of the year 512 tons of steel over and above the plan; A. Azarov, who has produced 380 tons; and V. Nesterovich, who has produced 581 tons of steel.

Every day new communist tendencies force their way, the people's

*Udarnik [Shock worker].

communist consciousness grows. Most of the sections in Machine Shop No 3 work without supervisors; a worker's conscience is the best of supervisors -- has become the motto here. A public rate-setting bureau, at the head of which is a Communist Labor Udarnik Comrade Snitko, works actively in the shops.

Many workmen in the Casting Shop No 4 display a truly communist attitude towards work, they make known their reserve of their own accord. Thus, for instance, workmen Ye. Kudin, D. Novitskiy, O. Tsiunchik, N. Gavrilov, V. Mul'tan and G. Kukhareenko have asked the leaders of the shop to revise the output-standards at the operations performed by them in the sense of increasing them. As a result, labor consumption in parts machining has been reduced 10-20 percent.

Everything that is new and progressive has the support of the plant's workers. Workmen of 44 production sections have backed the initiative of the multiple-spindle automatic machine section in Machine Shop No 3 and the core section of the Steel Shop "For Progressive Organization of Labor at Every Operator's Position". More than a thousand workmen are active followers of the patriotic initiative of the plant's fitter, Comrade Prikhodchenko, "For Technical Progress at Every Operator's Position".

The following bureaus were organized at the plant and are now in active operation: 13 public design, 18 public rate-setting and 12 social-economic bureaus. Seventeen complex brigades are engaged in the metal-saving work.

Members of the public-design bureau at the plant have worked out 303 measures, out of which 199 were adopted. The total annual economy derived from the introduction of the measures amounts to 174,992 rubles; it is more than 1,000 rubles per OKB [obshchestvenno-konstruktorskoye byuro-Public Design Bureau] member (at socialist pledges of 200 rubles).

Two hundred and nineteen persons have participated in the public rate-setting bureaus; all of them give every possible assistance to the rate-setting staff in regulating standardization and fulfillment of the plan for the decrease of labor consumption. The public rate-setting bureaus have led the work in the shops dealing with the study of losses in working time.

Mass self-photography, covering 400 workmen, was conducted with the participation of the members of the rate-setting bureau in Machine Shop No 3. On the analysis of the expenditures of work time, 156 suggestions were received from the workers, aimed at increasing labor productivity and decreasing work time losses. The shop has selected 150 output standards; this permitted to reduce the labor consuming nature of a set of tractor parts by 7 percent.

In 1962, 4,256 production standards were revised at the plant with the collaboration of the members of the public rate-setting bureau. The labor-consuming character of the Belarus' tractor was reduced in 1962 by 164.9 norm-hours.

In the past year, the plant's innovators have introduced 5,712 suggestions. The total economy resulting from the introduction of the suggestions amounts to 6,208,200 rubles.

In order to guarantee the fulfillment of the Party's and the Government's decisions in equipping kolkhozes and sovkhozes with new up-to-date equipment and a complete mechanization of agriculture, our designers have developed a new wheeled tractor, the Belarus' MTZ-50. The latest achievements of domestic and foreign tractor building, as well as the wishes of the country's machine operators in agriculture, were taken into consideration in this machine.

The MTZ-50 is equipped with a new small 50-55 hp D-50 diesel engine and a number of new advanced devices, which distinguish it favorably from previously manufactured models.

The use in the transmission of a torque booster in conjunction with a 9-speed gear box, does not only double the number of transmission gears, but also provides the change of speed when the tractor is in operation. The transportation speed is increased to 25 kilometers per hour.

The tractor is equipped with a split-unit water system with an improved design of the drawbar mechanism, a hydrostatic driving wheel recharger, which permits to change the load on a wide range depending on the nature of the work performed.

In order to ensure aggregation with the entire group of agricultural machines and means of transport contemplated for adoption, the MTZ-50 tractor is equipped with rear and side gear selective shafts, a tow device with a bumper, a brake control drive for the trailers, a hydraulic trailer grapnel, etc. The rear gear selective shaft has a completely separate, as well as a synchronous drive, making it possible to work with trailers with an operating driving gear.

A more comfortable cab, with air-flow ventilation and a set with good cushioning, is used in the MTZ-50 tractor. To facilitate steering, there is a hydraulic steering gear booster.

The tractor is spring-mounted, it has a mechanism for changing the rear wheel tread width, a compressor for tire inflation, a device for automatic filling of the fuel tank and other devices for facilitating the work of the tractor operator.

Based on the MTZ-50, a modified, 4-wheel drive version, has been developed -- the MTZ-52. This tractor, unlike the earlier manufactured MTZ-7 model, is a general-purpose tractor, since it has adjustable wheels; the clearance under the front driving bridge is the same as under the arms of the divided axles of the rear wheels -- 640 mm. The tractor has another advantage in that the front driving bridge is put in gear automatically as soon as rear wheel skidding reaches 7-8 percent.

The efficiency of the new tractor is 15-20 percent higher in comparison with the machines manufactured earlier with a considerably lower metal consumption. The MTZ-50 is 300 kg lighter than the tractor MTZ-5LS/5MS, and its efficiency is 10-12 percent greater. Tractors MTZ-50 and MTZ-52 possess great universality, they ensure a full complex of operations in corn and sugar-beet cultivation, where up to the present time only the crawler tractors, KDP-35 and T-38, were used.

The MTZ-50 tractor serves as the basis, with due regard to the

maximal unification, for the development of a cotton modification of the MTZ-50Kh tractor and a MTZ-54 crawler tractor of the 2-ton class.

Up to the present, mechanization of cotton growing is based primarily on the 0.9-ton class of tractors, which, because of inadequate power, are used with a four-row machine system and operate at comparatively low speeds.

The introduction of a cotton tractor of the 1.4-ton class will make it possible to change to a 6-row cultivation system, increasing operation speeds at the same time.

In the course of the current year, the plant will manufacture 75 experimental MTZ-50 Kh tractors and will conduct their extensive field tests.

The plant's designers have designed a narrow track crawler tractor, the model MTZ-54V, intended principally for the mechanization of work in vineyards. The engine, the clutch, the gear box, the water system units and a number of other units in this tractor are fully unified with the wheel-type MTZ-50 tractor. Experimental models of the MTZ-54V tractor were tested on the fields of Georgia and Moldavia.

At the present time, the design of the tractor is completed (taking into account the results of the tests) and new models have been manufactured for control testing during the agricultural season of 1963. This work is performed in collaboration with the Kishenev Tractor-Assembly Plant, where the manufacture of MTZ-54V tractors will be organized.

The transition to the manufacture of the new MTZ-50 tractor is made in two stages. In the first stage, accomplished by the plant in 1962, the intermediate model was introduced -- MTZ-50PL tractor, which has a new chassis and a series engine. Forty-five thousand machines of this type were manufactured in 1962. The production of MTZ-50 tractors (the second stage) will be started in the third quarter of 1963 with the mastering of the mass production of D-50 engines at the specialized Minsk Motor Plant.

As mentioned at the March (1962) Plenum of the CPSU Central Committee, in order to complete the work within the dates set by agricultural engineering, it is necessary to double the output of agricultural machinery, including the output of tractors -- 130 percent. In the All-Union production of tractors the share of production of the Minsk plant will be increased to 17.5 percent.

Organizing the mass production of improved machinery required persistent work on the part of the plant's workers for the introduction of new equipment, putting into practice of the planned measures of mechanization and automation of production, improvement of the manufacturing methods and accomplishing a number of scientific and research projects.

During the past 1962, 5,000 more tons of castings were produced by mechanized molding than in 1961. The standard of mechanization of molding and cleaning of cast material exceeds 95 percent of the total production of all types of casting.

Last year, the cast iron shop produced over 8,000 tons of cast material on the basis of progressive manufacturing processes.

The plant continues successfully the work on the automation of processes in the preparation of molding mixtures. At the present time, the work of adjusting automatic equipment is in progress on four runner units of the steel foundry.

In recent years, 41 constant-flow and 8 automatic lines were installed in the plant's machine shop on which the machining of parts of the MTZ-50 tractor has been mastered.

Sixty-eight automatic and semi-automatic machine tools and four machine tools with program control were installed in machine shops.

The plant's industrial laboratory has installed on 17 machine tools active control devices, including return communication equipment, disconnecting the machine tool when the size specified on the plan has been attained. The process of upsetting heads on bolt-type parts has been introduced. The formula has been developed and introduced on the horizontal broaching lathes of a new coolant, less costly than sulfonol, increasing the durability of the tool and the surface fineness of the machined parts.

Two semi-automatic machines for welding by friction have been designed, manufactured and installed. This has reduced metal consumption by 4.53 kg per tractor and the labor consumption by 66 minutes.

For the first time, in domestic tractor building, T-shaped butt welding of gear box yokes has been adopted instead of assembled ones, which permitted to decrease sharply the sizes of the box and, consequently, to reduce its weight.

A progressive process is practiced in the forge shop -- shaping of blanks on rollers, which results in an appreciable saving of metal.

The BS-182 unit-type drilling machine has been adopted for the machining of flywheel housing reducing labor consumption by 22.3 minutes per tractor.

It is gratifying to note that in the past year the interoperational transportation in machine shops was supplemented with new conveyers and transporters for feeding of parts and units with a total length of 850 meters.

Progressive methods of welding are used more and more extensively at the plant. At the beginning of 1963, the share of mechanized welding amounted to 79 percent of all welding jobs.

Induction heating for hardening of parts by high-frequency current and heating of blanks prior to stamping is used extensively at the plant. All of the plant's fuel oil and a part of electric heat-treating furnaces, as well as all preheating furnaces are converted to gas; automatic temperature rate control has been adopted.

The plant's foundries successfully fulfill the tasks of manufacturing brake band made of metal ceramics, investment pattern casting and chill casting. The 1962 output of precision casting was increased 30 percent as against the previous year.

Much has been achieved at the plant in the sphere of mastering and development of new manufacturing processes in the manufacture of

parts by the pressure method. A new method of manufacturing bevel pinions (stamping with simultaneous forming of teeth) and slot rolling on shafts is being introduced. A heat-treating furnace for unoxidizing heating has been designed.

The economic effect in 1962, at the plant, amounted to 360,000 rubles from the measures introducing new machinery and progressive techniques of mechanization and automation.

The plant's workers give their special attention to the problem of increasing the dependability and durability of the machines, since an increase in the life of a tractor is equivalent to an additional output of hundreds and thousands of machines.

It should be mentioned that at the beginning of 1962, during an uninterrupted change to the manufacture of the new model of tractors, certain manufacturing and constructional errors were made, there were more frequent instances of violation of the manufacturing discipline on production sections. All this led to a considerable increase in the number of complaints regarding the new tractor.

Measures were taken by the plant for the removal of the discovered defects at the earliest possible date. An extensive inspection of the condition of tractors in the course of operation was conducted in different regions of the country.

From the results of the plant's experts' visits to the provinces, as well as the results of the control testing of the machines, the plant has worked out a complex of organization and technical measures for the improvement of the quality of the MTZ-50PL tractor.

Taking into consideration the peculiar features of the new tractor's design, the insufficient knowledge of mechanizers of agriculture of the working principle of the machine and rules of operation, the plant's management has conducted 50-hour seminars with engineers-in-chief and mechanical engineers of the oblast associations of the Sel'khoztekhnika of different regions of the country. Altogether, 162 persons have completed this course of training. Moreover, a seminar with instructors of the Institute of Mechanization of Agriculture was conducted.

A daily analysis of the quality of the manufactured products, as well as a strict control over the execution of the planned measures, has enabled the plant, by the end of 1962, to eliminate defects such as, for instance, the fracture of the front axle, a crack in the block of the pulley, going out of commission of a bearing bushing, breaking of front wheel naves, etc.

It is shown by the analysis that breaking down of parts and their untimely going out of commission is also due to flagrant violation on the part of tractor operators of operating instructions for the new tractors. As a result of this there were such defects as the going out of commission of the release bearing because of the untimely adjustment of the clutch, crankshaft blocking after the tractor's continuous running due to insufficient or low-grade lubrication.

A number of additional measures is taken at the present time by the plant for a further improvement in this quality of the manufactured tractors.

Before the start of the spring sowing, the plant has planned to send a group of experts to various regions of Tselinnyy Kray in order to give assistance in the technical training of the personnel and instructing machine operators in the correct operation of the MTZ-50PL tractor.

In addition, it has been planned to conduct a conference at the plant in the near future on questions dealing with the quality of machinery with the participation of machine operators of agriculture and suppliers of outfitting articles. Such a meeting will be useful both for the manufacturers of machines and for consumers.

The plant's technical services and shops are engaged in working out additional measures for improving the quality of parts and units of tractors. Dates and specific executors have been fixed, supervision of the execution of every paragraph of the measures has been tightened.

Public inspection of the quality of the production, which is conducted by the plant commission under the chairmanship of the plant's Chief Engineer Z. S. Rubanov, is performed with the object of drawing in, on a wide scale, of workmen, engineering and other technical and non-technical workers of the plant into the work of improving the quality of the manufactured goods.

The winner in the public inspection will be considered that collective of the shop from which the greatest number of suggestions for the improvement of the quality of the manufactured products will be received. In summing up the results of the inspection consideration will also be given to the observance of the manufacturing discipline in various sections and shops, to the state of the manufacturing and control equipment, manufacture of products in the quantity of defects and losses through rejects.

The quality of tractors depends in a great measure on the quality of the starting materials, as well as the purchased items of equipment. Suffice it to say that purchased items take up 55 percent of the cost of the MTZ-50PL tractor.

In the mean time, some of the purchased items, received by the plant, continue to be of an inferior quality. In the first place this concerns the production of the Noginsk Fuel Apparatus Plant, Kiev Plant imeni Lepse, Shchuchinskiy Avtoproved Plant in the Grodnenskaya Oblast', Moscow Hydraulic Machinery Plant, etc.

In carrying out the decisions of the 22nd Congress of the CPSU, of the March and November (1962) Plenums, the plant's workers make every effort not only to fulfill and overfulfill the 1963 Plan in everyone of its qualitative and quantitative indices, but also to basically complete the plant's reconstruction for the subsequent building up of capacities and a sharp increase in the output of high-quality tractors.

T-50 VM VINEYARD TRACTOR

[Following is the translation of caption to the photograph appearing on the cover of the Russian-language journal Traktory i Sel'khoz mashiny (Tractors and Agricultural Machinery) Moscow, No 4, April 1963, inside front cover.]

The T-50 VM Vineyard Tractor of the Kishinev Tractor Assembly Plant. This machine is designed for the basic production processes in viticulture. The rated tractive force is 2 tons, design weight -- 3,200 kg, and engine power -- 50 hp at 1,500 rpm. The number of transmission gears: excluding the decelerator -- 5 (4.82 - 14.6 km/hr), including the decelerator -- 5 (1.28 - 4.17 km/hr), reverse - 2. The width of the tractor is 1,050 mm.

VARIOUS BUSH-BOG PLOWS PRODUCED BY
THE ODESSA PLANT

[Following is the translation of several short items on bush-bog plows in the Russian-language journal Traktory i Sel'khoz mashiny (Tractors and Agricultural Machinery) Moscow, No 4, April 1963, inside back cover.]

Bush-Bog Plows produced by the Odessa Plant imeni Oktyabr'skaya Revolyutsiya. Orders for these plows can be placed through the local department of the All-Union Association -- Sel'khoztekhnika.

The tractor-mounted, two-bottom PBN-2-54 Zubr Plow is designed for the initial plowing of mineral and peat-swamp soils which are brush-free. This plow is used with the DT-54A, DT-55A, or T-75 tractor. The plowing depth is 30 cm, working width -- 108 cm, (rated) productivity -- 0.5 - 0.65 ha/hr, and the weight -- 720 kg.

The tractor-drawn, two-bottom PKB-2-54M plow is designed for the initial plowing of mineral and peat-swamp soils which are brush-free. The plow is raised and lowered by either a mechanical automatic [device] or through an hydraulic cylinder. The plow is used with the DT-54, DT-54A, DT-55, DT-55A, or T-75 tractor. The plowing depth is 30 cm, working width -- 108 cm, (rated) productivity -- 0.5 - 0.65 ha/hr, and weight -- 1,630 kg.

The tractor-mounted, single-bottom PBN-75 Bizon Plow is design for the initial plowing of marshes covered with underbrush reaching a height of 2 meters and thicket-clogged areas.

The DT-54A, DT-55A, or T-75 tractors can be used with this plow. The plowing depth is 35 cm, working width -- 75 cm, (rated) productivity -- 0.35 - 0.45 ha/hr, and weight -- 730 kg.

The tractor-drawn, single-bottom PKB-75 plow is designed for the initial plowing of marshes covered with brush 2-meters high and thicketed areas. The plow is raised or lowered either by a mechanical-automatic [device] or a hydraulic cylinder. The DT-54, DT-54A, DT-55, DT-55A, or T-75 tractor can be used. The plowing depth is 35-cm, working width -- 75 cm, (rated) productivity -- 0.35 - 0.45 ha/hr, and the weight -- 1,435 kg.

The tractor-mounted, single-bottom PEN-60 Plow is designed for the initial plowing of heavy, marshy soils, covered with thickets. The plow is used with either the DT-54A, DT-55A, or T-75 tractor. The plowing depth is 35 cm, working width -- 60 cm, (rated) productivity -- 0.3 - 0.4 ha/hr, and weight -- 600 kg.

The tractor-drawn, three-bottom POB-3-45 plow is designed for plowing developed marshlands. Raising and lowering of the plow is accomplished by either a mechanical automatic [device] or hydraulic cylinder. The DT-54, DT-54A, DT-55, DT-55A, or T-75 tractor is used with this plow. The plowing depth is 35 cm, working width -- 135 cm, (rated) productivity -- 0.63 - 0.8 ha/hr, and weight -- 1,500 kg.

The tractor-mounted, single-bottom PBN-100A. Plow is designed for the initial plowing of bogs, covered with brush 5-meters high and thickets. The S-100GP tractor is used with this plow. The plowing depth is 40 cm, working width -- 100 cm, (rated) productivity -- 0.36 ha/hr, and weight 850 kg.

UNIFIED PARTS USED ON TRACTORS
(Unified Tractors)

[Following is the translation of an article by M. Starikov, Candidate in Technical Services in the Russian-language journal Sel'skiy Mekhanizator (Agricultural Machine Operator) Moscow, No 4, April 1963, page 11.]

Presently, design bureaus do much towards the unification of parts and units for tractors. Unification will curtail considerably the products list of parts produced by tractor plants and by plants producing spare parts. It will increase the quality of the parts and result in improved tractor operation.

First of all, such single-type tractors as the DT-75 and T-74 are being unified. The production of these tractors is being organized at various plants.

Full unification of all of the parts and units on the DT-75 and T-74 tractors has not been possible because of the basic difference in the frame design, transmission, rear axle, and flange gears. However, about 50 percent of the parts and units have been unified.

Now, the DT-75 is equipped with the SMD-14 engine produced by the Khar'kov Serp i Molot Plant. The T-74 tractor uses the SMD-14A engine. The SMD-14A diesel engine has the appearance of a modified SMD-14 diesel. They differ only in that the fan shaft is placed 70 mm to the right of the universal shaft and in the supports for placing the diesel on the frame. The clutch, which is supplied by the Serp i Molot Plant, together with the engine, are completely unified for both tractors.

The crawler treads are unified on the chassis as well as the housing for the carrier rollers and internal bushings, [gears] seals, support rollers, and rutted roller shafts.

The pump is unified in the hydraulic system as well as the hydraulic distributor, cylinders, clutch disengagers, shut-off valves, filters, and elements of the coupling apparatus and hoses. The parts and units are interchangeable with those on the DT-54 and T-75 tractors.

The mounting mechanisms are completely unified on all crawler tractors of the 3-ton class. In uniting the cab, the cab of the DT-75 tractor was used as the base. This cab ensures completely the needs of the tractor driver: it is sun-tight, has a soft and adjustable seat, it is insulated, and it has its own heating and ventilation systems.

All devices and electrical equipment are unified on these tractors.

The Khar'kov Tractor Plant has equipped the T-74 tractor with unified units for testing (see photo). [Comment: Photograph of the T-74 tractor has not been reproduced for this report.]

Tests, in 1963, will show the workability and reliability of the unified parts and units.

NATI [Nauchno-issledovatel'skiy Avtotraktornyy institut; Automotive and Tractor Scientific Research Institute].

SPEEDY PRODUCTION OF THE SK-4 COMBINE

[Following is the translation of the caption to the photograph on the back cover of the Russian-language journal Sel'skiy Mekhanizator (Agricultural Machine Operator) Moscow, No 4, April 1963.]

A new SK-4 self-propelled combine comes off main conveyer at the Rostsel'mash [Rostov-na-Donu Agricultural Machine Building] Plant every 5 minutes.

The photograph shows the combine being loaded onto a platform. It will soon be on its way. [Comment: Photograph not reproduced here.]

ANSWERS TO QUESTIONS ABOUT
THE T-40 TRACTOR

[Following is the translation of an item in the Russian-language journal Sel'skiy Mekhanizator (Agricultural Machine Operator) Moscow, No 4, April 1963, page 3.]

Machine operator, M. Polikov, of the Druzhba Kolkhoz, Latvian SSR had submitted some questions, about the T-40 tractor, to the Lipetsk Tractor Plant. The LTZ chief designer has answered these questions as follows:

To adjust the engine valves, it is necessary to remove the coupling [kardan] from the hydraulic booster shaft or the fork joints from the steering gear shaft (in the front wall of the cab) and then place the cardan to one side.

To have a tractor tread width of 1,218 mm, it is necessary to arrange the wheels so that the curved side of the wheel disks face the outside. In rearranging the wheel rim, the tire markings, with the inscription "rotation direction" should face the direction in which the wheels turn when the tractor is in forward motion.

In 1962, the Lipetsk Tractor Plant conducted tests to determine the optimum length of the decompressor shaft [ruchka]. Tests showed that the shaft requires lengthening. This is being done on tractors produced in 1963.

There should be a small gap in the cross pieces of the cardan which should not be too noticeable in the increased free-play of the steering wheel. Free-play in the steering wheel generally will increase when it is disconnected from the hydraulic booster, when diminishing the hinged joints of the wheel trapezium and changing the regulation of the hydraulic booster. If the gap is greater than 0.4 mm, and the parts have not completed their cycle, send them (the cross pieces of the cardan and bushings) to the plant for replacement.

In the first group of tractors produced, RR-81 relay-regulators were used. These did not work adequately (the relay of reversible current was not completed after the engine stopped). Now, RR-315 relay regulators with seasonal adjusters (for summer and winter) are put on the tractors. It is planned to install switches and signal controls for breaks in the fan belt.

Low incandescence and slow heating of the control element coils is explained by the use of excessively thick coils (2-mm gage instead of one mm). At the present time, the plant is conducting rigid control in installing these control elements. Check the coil gage, if it is more than one mm, replace it.

It is not possible to enlarge the width of the tractor, just as it is not possible to arrange the wheels to get a tread width of 1,218 mm. The tractor driver's seat is set between the fenders in such a way that in order to enlarge the width, it would be necessary

to remove the fenders. Then the tractor would not be able to perform various operations in the cultivation of agricultural crops.

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